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	PIIN/SIIN W56HZV-07-C-0274	MOD/AMD P00002	
Name of Offeror or Contractor: BOSCH REXROTH CORPORATION			

SECTION A - SUPPLEMENTAL INFORMATION

PREVIOUS CONTRACT AMOUNT: \$4,099,960.00

AMOUNT THIS ACTION: -0-

CURRENT CONTRACT AMOUNT: \$4,099,960.00

1. This is a bilateral modification.
2. The purpose of this Modification P00002 is to revise the contract to require delivery of the monthly summary progress report on the twentieth day of each month in lieu of the tenth of each month as previously set forth in the contract.
3. The contract is hereby revised as follows:
 - a. Paragraph C.2.6 of the contract is revised to reflect the monthly summary progress report as due on the 20th day of each month.
 - b. Contract Data Requirements List (CDRL) A010 is revised to reflect the monthly summary progress report as due on the 20th day of each month.
4. By this action, the total amount of the contract is unchanged. All other terms and conditions of the contract are unchanged and in full force and effect.

*** END OF NARRATIVE A0002 ***

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Name of Offeror or Contractor: BOSCH REXROTH CORPORATION		

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.1. Technical tasks

The Contractor acting as an independent contractor, and not an agent of the Government, shall design, develop, build, test, demonstrate and validate performance and fuel economy gains for one (1) working Digital Displacement (DD) Infinitely Variable Transmission (IVT) series hydraulic drive (SHD) system. The system shall be installed on an International Truck and Engine MXT-MV and shall incorporate an Integrated Starter Alternator (ISA) system for exportable power.

- C.1.1 The contractor shall keep modifications to the MXT-MV to a minimum through use of best practice system design/integration methods.
- C.1.2 The contractor shall provide a feasibility study of a DD IVT system frame layout for heavier vehicles of up to 24000 lb GVW and present its progress in regularly scheduled review meeting as well as in the final report.
- C.1.3 Exportable power management will be demonstrated when parked.
- C.1.4 The requirement for the DD IVT series Hydraulic drive system-equipped MXT-MV demonstrator vehicle is to achieve a minimum target of 50% mpg fuel economy improvement compared to the baseline configuration vehicle, over the same EPA FTP 75 drive cycle.
- C.1.5 The DD IVT hydraulic series drive system (DD IVT SHD) equipped demonstrator (MXT-MV) shall have noise, vibration and harshness (NVH) target levels of not more than 1 dBA increase in noise at the drivers ear level during acceleration, and not more than 2 dBA increase during acceleration or deceleration compared to the baseline vehicle at the same operational conditions. The noise level of the baseline vehicle shall be determined through physical testing (Reference SAE standards: J986, J336 and J1470).
- C.1.6 The contractor shall develop high-level DDIVT SHD system/sub-system requirements and specifications for the MXT-MV and present them to the Government as a deliverable report 4 months after contract award in accordance with A009.
- C.1.7 The contractor shall perform complete system and sub-system Failure Mode and Effect Analysis (FMEA) for the DDIVT SHD system and present a summary of high-risk fault modes and definition of responses for those high-risk fault modes in a report to the Government in accordance with paragraph C.2.4.
- C.1.8 The Contractor shall provide trouble shooting, repair and service of the series drive system and IVT for a period of 1 year after delivery of the final report. The contractor shall submit a cost proposal for repair and service actions which are determined necessary by the COR. No work will be performed prior to negotiation and funding of repair and service efforts.
- C.1.9 The required ambient temperature range for the military application is -25 degrees F to +120 degrees F, under which conditions the vehicle with installed DDIVT SHD shall function without specific preparation or post-installed kits.
- C.1.10 The contractor shall prepare and maintain a master project plan and use it to graphically show events and jointly developed major milestones throughout the project progress.
- C.1.11 The contractor shall present with each monthly report a running account of project expenditure showing material, labor (Hours and Dollars)/ODC, travel, subcontracts, G&A and total cost.
- C.1.12 The hydraulic drive system, as installed on the demonstrator, shall not degrade the baseline vehicle performance characteristics such as acceleration, fuel economy and exhaust emissions.
- C.1.13 The contractor shall model and simulate the MXT-MV performance and fuel economy prior to any hardware build and physical testing in vehicle.
- C.1.14 The contractor shall conduct a thermal analysis of the platform models and predict extreme hot and cold performance prior to any hardware build and physical testing.
- C.1.15 The contractor shall host a start of work meeting no later than 15 working days after contract award and host monthly project progress and quarterly review meetings. No monthly meeting shall be held in a month that coincides with a quarterly review meeting. The monthly summary and quarterly technical, management and financial reports will be the basis of discussion during the monthly and quarterly meetings.

C.2 Deliverables

- C.2.1 The contractor shall produce (build) one (1) DDIVT SHD equipped MXT-MV demonstrator.
- C.2.2.1 One (1) commercially based truck, which is an MXT-MV, 4 Door, crew cab, 4 x 4 300 BHP Diesel, with 6000 pound payload, 19000

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pound gross vehicle weight (GVW). It will be configured as a 14000 to 16000 pound GVW truck, equipped with an operational DDIVT SHD system and an ISA system for exportable power. The demonstrator shall be available for demonstration by twenty four (24) months after contract award and receipt of MXT-MV. The MXT-MV demonstrator shall be delivered to TARDEC, in Warren MI. Target power of the ISA is 30kW at engine idle speed of 2000 RPM while the vehicle is in park. Exportable voltages will be 24 VDC and 110V single-phase.

C.2.2 The contractor shall deliver results of the engineering design and packaging models for the commercially-based MXT-MV truck demonstrator with the quarterly report closest to the vehicle delivery date in accordance with Contract Data Requirements List (CDRL) A008.

C.2.3 The contractor shall provide high-level DDIVT SHD requirements and specifications for the MXT-MV truck application in accordance with CDRL A009.

C.2.4 The contractor shall provide the system and component level FMEA report, three (3) months prior to scheduled delivery of the MXT-MV demonstrator in accordance with CDRL A003.

C.2.5 The contractor shall deliver seven (7) quarterly technical and financial reports in accordance with CDRL A002.

C.2.6 The contractor shall deliver sixteen (16) monthly summary progress reports due to the COR by the 20th of each reporting month, consistent with the monthly project progress review meetings and in accordance with CDRL A010. Submission of the summary progress report is not required in months when quarterly technical and financial reports or the final report is submitted.

C.2.7 The contractor shall deliver one (1) draft final report one (1) month prior to the completion of the period of performance in accordance with CDRL A001. The COR will review and comment on the draft report within 2 weeks. The contractor shall address the comments of the COR and deliver a final report within two weeks of receipt of those comments.

C.2.8 The contractor shall deliver minutes of all scheduled meetings starting with the Start of Work Meeting, no later than 5 days after the meeting in accordance with CDRL A011.

C.2.9 The contractor shall prepare a Design Validation Plan and Report (DVP&R), to include DDIVT bench testing, full dynamometer testing with engine, control strategy and calibration plan with regenerative braking, engine stop/start option, exportable power management when the vehicle is parked in accordance with CDRL A004.

C.2.9.1 The contractor shall deliver characterization data for the pump and the pump motor in accordance with CDRL A004.

C.2.10 CAD packaging shell models (i.e. surface models) of system installation for each vehicle shall be delivered to the Government COR with the closest quarterly report prior to the delivery date of that vehicle in accordance with CDRL A005.

C.2.11 The contractor shall prepare a Safety Assessment Report (SAR) prior to the availability of the vehicle to the Government for testing and/or demonstration in accordance with CDRL A006.

C.2.12 The contractor shall conduct baseline vehicle testing, validate vehicle performance and fuel economy with the systems installed, compare with baseline results and present the results to the Government. Reporting shall be completed in the closest quarterly report prior to delivery of the truck in accordance with CDRL A002.

C.2.13 The contractor shall conduct a weight study for the MXT-MV demonstrator. The weight study shall calculate, based on the component design and system architecture, any weight increase as the result of adding the DD IVT SHD to the vehicle. The results of the weight study shall be reported be in the quarterly report closest and prior to the delivery date of the MXT-MV.

C.2.14 The contractor shall conduct a start of work meeting at TACOM no later than 15 working days after the contract award.

C.2.15 The contractor shall conduct a cost/price study to determine the total system price for the MXT-MV relative to various production volume scenarios as agreed upon with the COR, and deliver the study with the final report in accordance with CDRL A007.

C.2.16 The contractor shall deliver a report of vehicle performance modeling and thermal analysis five (5) months after the contract award.

C.2.17 The contractor shall provide, as a part of the final report, a comparison of the baseline vehicle performance (fuel economy and emissions) to the hydraulic hybrid system supplied on the MXT-MV, at the end of the contract performance.

C.3. GFE/GFI The following items will be provided as Government Furnished \Equipment\Government Furnished Information.

C.3.1 Military drive cycle definition/information or an alternative, mutually agreeable drive cycle no later than 10 days after the Start of Work Meeting.

C.3.2 Mission requirement information (as needed)

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C.3.3 The information required to perform system modeling. This would include, but is not limited to, powertrain maps, gear ratios, transmission shift schedules, etc. based on availability. The Contractor shall provide a definition of the required information once the contract is in place. Since this information needs to be procured through other sources, the Government will endorse and support the Contractors procurement of the required information.

C.3.4 The Government shall provide one International Truck and Engine, MXT-MV truck with an electronically controlled engine to be used as the demonstrator platform for DDIVT SHD no later than fifteen working days after contract award.

C.4. Hardware Ownership/Disposition

All hardware procured and fabricated under this contract shall become the property of the Government unless the contractor is notified otherwise. The contractor, upon conclusion of the work, shall deliver all hardware to the Government (TARDEC, in Warren, MI).

*** END OF NARRATIVE C0001 ***

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Name of Offeror or Contractor: BOSCH REXROTH CORPORATION			

SECTION J - LIST OF ATTACHMENTS

List of Addenda	Title	Date	Number of Pages	Transmitted By
Exhibit A	CONTRACT DATA REQUIREMENTS LIST			

CONTRACT DATA REQUIREMENTS LIST

Form Approval OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 440 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO 0001 B. EXHIBIT: A C. CATEGORY:
D. SYSTEM/ITEM: E. CONTRACT/PR NO.:
F. CONTRACTOR: Bosch Rexroth Corporation

1. DATA ITEM NO. A001 2. TITLE OF DATA ITEM: Final Report
3. SUBTITLE: Series Hydraulic Hybrid Drive
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.7 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: DD 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: One Time
11.AS OF DATE: 12. DATE OF FIRST SUB: 23 MAC 13. DATE OF SUBS.SUB: 24 MAC

14. DISTRIBUTION
A. ADDRESSEES B. COPIES DRAFT FINAL
Heather McKee, Contracting Officers Technical Representative, 1

15. TOTAL: 1

16. REMARKS: The report shall include all design/packaging data and results for the demonstrator and will include all related deliverables as appendices.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A002 2. TITLE OF DATA ITEM: Quarterly Technical and Financial Report
3. SUBTITLE:
4. AUTHORITY DI-FNCL-80912 5. CONTRACT REFERENCE: C.2.5, C.2.12, C.2.13 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: Quarterly
11.AS OF DATE: 12. DATE OF FIRST SUB: 3 MAC 13. DATE OF SUBS.SUB:

14. DISTRIBUTION A. ADDRESSEES B. COPIES DRAFT FINAL
Heather McKee, Contracting Officers Technical Representative, 1
Rosalie Williamson, Contract Specialist 1

15. TOTAL: 2

16. REMARKS:
All reports are to be delivered electronically. All Submissions shall be in Government compatible format, e.g. Word 97 or higher. Contact Government COR for information.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO.A003 2. TITLE OF DATA ITEM: System/Component Level FMEA
3. SUBTITLE: MXT-MV
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.1.7, C.2.4 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED:A 10. FREQUENCY: Two Times
11.AS OF DATE: 12. DATE OF FIRST SUB: See Block 16 13. DATE OF SUBS.SUB:

14. DISTRIBUTION A. ADDRESSEES B. COPIES DRAFT FINAL

Heather McKee, Contracting Officers Technical Representative, 1

15. TOTAL: 1

16. REMARKS: The FMEA shall be delivered 3 months prior to delivery of the MXT-MV demonstrator.
All reports are to be delivered electronically. All Submissions shall be in Government compatible format, e.g. Word 97 or higher.
Contact Government COR for information.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A004 2. TITLE OF DATA ITEM: DVP&R
3. SUBTITLE:
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.9 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: 10. FREQUENCY: One Time
11.AS OF DATE: 12. DATE OF FIRST SUB: 6 MAC 13. DATE OF SUBS.SUB:

14. DISTRIBUTION A. ADDRESSEES B. COPIES DRAFT FINAL

Heather McKee, Contracting Officers Technical Representative, 1

15. TOTAL: 1

16. REMARKS:
The report shall include all items described in C.2.9. All reports are to be delivered electronically. All Submissions shall be in Government compatible format, e.g. Word 97 or higher. Contact Government COR for information.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A005 2. TITLE OF DATA ITEM: System Packaging/Installation
3. SUBTITLE: 3 Dimensional CAD
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.10 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: One Time
11.AS OF DATE: 12. DATE OF FIRST SUB: See Block 16 13. DATE OF SUBS.SUB:

14. DISTRIBUTION A. ADDRESSEES B. COPIES DRAFT FINAL

Heather McKee, Contracting Officers Technical Representative, 1

15. TOTAL: 1

REMARKS:
Deliver with the quaterly report closest to the vehicle delivery date.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A006 2. TITLE OF DATA ITEM: Safety Assessment Report (SAR)
3. SUBTITLE:
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.11 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: Two Times
11.AS OF DATE: 12. DATE OF FIRST SUB: See BLock 16 13. DATE OF SUBS.SUB:

14. DISTRIBUTION A. ADDRESSEES B. COPIES DRAFT FINAL
Heather McKee, Contracting Officers Technical Representative, 1

15. TOTAL: 1

16. REMARKS:
The SAR for the MXT-MV is due nine (9)months after award.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A007 2. TITLE OF DATA ITEM: Cost Study
3. SUBTITLE: MXT-MV with ISA
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.15 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: Two Times
11.AS OF DATE: 12. DATE OF FIRST SUB: 23 MAC 13. DATE OF SUBS.SUB: 24 MAC

14. DISTRIBUTION A. ADDRESSEES B. COPIES DRAFT FINAL
Heather McKee, Contracting Officers Technical Representative, 1

15. TOTAL: 1

16. REMARKS:
The cost study is to be submitted as part of the Final Report.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A008 2. TITLE OF DATA ITEM: System Packaging/Installation
3. SUBTITLE: MXT-MV
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.2, C.2.10 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: One Time
11.AS OF DATE: 12. DATE OF FIRST SUB: See Block 16 13. DATE OF SUBS.SUB:

14. DISTRIBUTION A. ADDRESSEES B. COPIES DRAFT FINAL
Heather McKee, Contracting Officers Technical Representative, 1

15. TOTAL: 1

16. REMARKS:

Deliver with the quarterly report closest to the demonstrator vehicle availability date.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A009 2. TITLE OF DATA ITEM: System Specification
3. SUBTITLE: MXT-MV
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.3 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: One Time
11. AS OF DATE: 12. DATE OF FIRST SUB: 120 DAC 13. DATE OF SUBS. SUB:

14. DISTRIBUTION A. ADDRESSEES B. COPIES DRAFT FINAL
Heather McKee, Contracting Officers Technical Representative, 1

15. TOTAL: 1

16. REMARKS:

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A010 2. TITLE OF DATA ITEM: Summary Report
3. SUBTITLE: Monthly
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.6 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: Monthly
11. AS OF DATE: 12. DATE OF FIRST SUB: See Block 16 13. DATE OF SUBS. SUB:

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Rosalie Williamson, Contract Specialist 1

15. TOTAL: 2

16. REMARKS:

Monthly summary report is due on the 20th of each month, consistent with the monthly project progress review meetings starting five weeks after the award of the contract. Submission is not required in months when the quarterly or final reports are required.

17. PRICE GROUP: 18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A011 2. TITLE OF DATA ITEM: Meeting Minutes
3. SUBTITLE: Minutes
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.1.15, C.2.8, C.2.14
6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: Minutes
11. AS OF DATE: 12. DATE OF FIRST SUB: 15 DAC 13. DATE OF SUBS. SUB:

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Rosalie Williamson, Contract Specialist 1

15. TOTAL: 2

16. REMARKS:

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO. A012 2. TITLE OF DATA ITEM: System Modeling and Simulation
3. SUBTITLE: MXT-MV
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.1.13 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: One Time
11. AS OF DATE: 12. DATE OF FIRST SUB: 13. DATE OF SUBS.SUB:

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		15. TOTAL:		1

16. REMARKS:

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE:

1. DATA ITEM NO: A013 2. TITLE OF DATA ITEM: System Packaging/Installation
3. SUBTITLE: 3 Dimensional CAD
4. AUTHORITY DI-MISC-80508A 5. CONTRACT REFERENCE: C.2.17 6. REQUIRING OFFICE: AMSRD-TAR-N
7. DD250 REQ: LT 8. APP CODE: 9. DIST. STATEMENT REQUIRED: A 10. FREQUENCY: One Time
11. AS OF DATE: 12. DATE OF FIRST SUB: 23 MAC 13. DATE OF SUBS.SUB: 24 MAC

14. DISTRIBUTION	A. ADDRESSEES	B. COPIES	DRAFT	FINAL
	Heather McKee, Contracting Officers Technical Representative,			1
		15. TOTAL:		1

16. REMARKS:

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE: